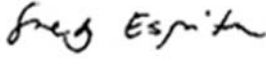


February 7, 2013

To : Faculty of Engineering Graduate Curriculum and Policy Committee

From : Medy Espiritu 
Assistant Secretary and SynApps System Administrator

The next meeting of the Faculty of Engineering Graduate Curriculum and Policy Committee will be held on Wednesday, February 13, 2013 at 2:30 p.m. in MUSC-313.

Listed below are the agenda items for discussion.

A G E N D A

- I. Minutes of the meeting of February 16, 2012
- II. Business arising
- III. 2013-2014 Graduate Curriculum Changes
 - a) **Biomedical Engineering**

Course cross-listing:

*795 – Nanotechnology in Chemical Engineering (*to be cross-listed as Chemical Engineering *791*)

Course cancellations:

*730 – Fluid Mechanics
*733 – Computational Fluid Dynamics
*780 – Biomaterials and Tissue Engineering

- b) **Chemical Engineering** (Dr. Chris Swartz)

- M.A.Sc. and M.Eng. programs – elimination of Internship Program

- M.A.Sc. and M.Eng. programs – change in admission requirements

New courses:

#740 – Advanced PSE Tools and Methods

#741 – Energy Systems Engineering

Course cross-listing:

*791 – Nanotechnology in Chemical Engineering (*to be cross-listed as Biomedical Engineering *795*)

Course cancellations:

*730 – Fluid Mechanics

*733 – Computational Fluid Dynamics

*751 – Advanced Mathematics in Chemical Engineering

*755 – Dynamic Optimization

*780 – Biomaterials and Tissue Engineering

c) **Civil Engineering** (Dr. Ioannis Tsanis)

- Ph.D. program – change in the comprehensive examination procedure

New courses:

*727 – Seismic Isolation and Structural Control

*735 – Advanced Water and Wastewater Treatment Processes

d) **Computing and Software** (Dr. Antoine Deza)

New courses:

*763 – Certified Programming with Dependent Types

*764 – Advanced Topics in Data Management

*765 – Wireless Networking and Mobile Computing

e) **Electrical and Computer Engineering** (Dr. Thia Kirubarajan)

New course:

*776 – Electromagnetic Scattering from Random Media

f) **Engineering Physics** (Dr. Ray LaPierre)

- M.A.Sc. program – change in the wording for the required number of courses

- M.Eng. program – change in the wording for the required number of courses

New course:

*6Z03 – Semiconductor Manufacturing Technology

Change in course titles:

*6D03 – Nuclear Reactor Physics (*currently cross-listed as UN0802 – Nuclear Reactor Physics*)

UN0802 – Nuclear Reactor Physics (*currently cross-listed as *6D03 – Nuclear Reactor Physics*)

g) **Materials Science and Engineering** (Dr. Joey Kish)

New courses:

#730 – XRD2 and XRD3 Diffraction Methods for Materials

#745 – Electrochemical Techniques: Theory & Applications

Change in prerequisite:

#732 – Analytical Electron Microscopy

Change in course description:

#731 – Introduction to Electron Microscopy

Change in course title and description:

*6F03 – Synthesis, Applications and Environmental Impact of Nanomaterials

Course cancellation:

*6AA3 – Computational Thermodynamics

h) **Mechanical Engineering** (Dr. Joe McDermid)

*755 – Advanced Control on Internal Combustion Engines

i) **School of Engineering Practice** (Dr. Samir Chidiac)

New courses:

*719 –Special Topics in Engineering/Technology Entrepreneurship and Innovation

*771 – Walter G. Booth School of Engineering Practice Seminar Series

- M. Eng. Manufacturing Engineering –change in admission and course requirements

Course cancellation:

*700 – Work Term Report

j) **Interdisciplinary program**

M.Sc. eHealth (Dr. Norm Archer)

- Change in course requirements

New course:

*705 – Statistics for eHealth

**FACULTY OF ENGINEERING GRADUATE CURRICULUM AND POLICY COMMITTEE
FEBRUARY 16, 2012, 1:00 PM
MUSC-318**

PRESENT: Dr. H. Sheardown (Chair), Ms. S. Baschiera (Secretary), Dr. A. Deza, Mr. H. El-Sewify, Dr. P. Guo, Mr. J. Jaskolka, Dr. J. Kish, Dr. R. LaPierre, Dr. T. Maibaum, Dr. J. McDermid, Mr. R. Pukadyil, Mr. B. Statham, Dr. C. Swartz, Mr. J. Yau, Mr. E. Yu, Mrs. M. Espiritu (Assistant Secretary)

BY INVITATION: Dr. M. Noseworthy

I. Minutes of Meeting

The minutes of the meeting of April 12, 2011 were approved on a motion by Dr. Swartz, seconded by Dr. Deza.

II. Business Arising

There was no business arising from the minutes of the previous meeting.

III. Graduate Curriculum Recommendations

Biomedical Engineering

The School of Biomedical Engineering has proposed a change in the calendar description of the admission requirements. The School also proposed cross-listing of ECE *6BD4 – Biomedical Instrumentation (as BME *6BD4) and MECH *717 – Current Topics in Orthopedic Biomechanics (as BME *717).

Dr. McDermid moved, and Dr. Deza seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed changes from the School of Biomedical Engineering, as described in the documents.”

The motion was carried.

Computing and Software

A change in course title and description for *701 – Logic and Discrete Mathematics and *738 – Algebraic Methods in Software Engineering and Computer Science was proposed by the Department of Computing and Software.

Dr. Deza moved, and Dr. McDermid seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed change in title and description for courses, *701 and *738, as described in the documents.”

The motion was carried.

Civil Engineering

The Department of Civil Engineering proposed the following graduate curriculum changes:

Course cancellations:

- *6C03 – Environmental Impact and Sustainability
- *6D04 – Geometric Highway Design
- *6H03 – Analysis of Transportation Systems
- *6U03 – Unit Operations and Processes in Environmental Engineering
- #791 – Municipal Solid Waste Management
- #792 – Hazardous Waste Management

New courses:

- *6CM4 – Advanced Construction Management
- *6SD4 – Structural Dynamics and Earthquake Engineering
- *6V04 – Biological Aspects of Wastewater Engineering
- *738 – Seismic Behaviour, Analysis and Design of Masonry Structures
- *758 – Introduction to Mechanics of Elastic/Inelastic Solids

Change in course number:

- *6G03 – Pavement Materials & Design – change to *6G04

Dr. McDermid moved, and Dr. Deza seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed curriculum changes from the Department of Civil Engineering, as described above.”

The motion was carried.

Engineering Physics

The Department of Engineering Physics proposed the following changes to its graduate curriculum:

New courses:

- *777 – Advanced Photovoltaics
- *783 – Nuclear Fuel Engineering (to be cross-listed as UN 0806)
- *784 – Nuclear Fuel Management
- UN 0806 – Nuclear Fuel Engineering (to be cross-listed as *783)

Change course number:

- UN 0902 – Fuel Management – change to UN 0501

Dr. Deza moved, and Dr. McDermid seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed curriculum recommendations from the Department of Engineering Physics, as described above.”

The motion was carried.

Materials Science and Engineering

The Department of Materials Science and Engineering proposed the following changes to its graduate curriculum:

New course:

- #733 – Materials Characterization by Electron Microscopy

Course cancellations:

- #756 – Deformation and Fracture of Crystalline and Amorphous Polymers
- #763 – Physical Behaviour of Amorphous Solids

Dr. McDermid moved, and Dr. Deza seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed curriculum changes from the Department of Materials Science and Engineering, as described above.”

The motion was carried.

Mechanical Engineering

The following changes were proposed by the Department of Mechanical Engineering:

New courses:

- *6B03 – Topics in Product Development
- *717 – Current Topics in Orthopaedic Biomechanics (to be cross-listed as BME *717)

Dr. McDermid moved, and Dr. Deza seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the proposed changes from the Department of Mechanical Engineering, as described above.”

The motion was carried.

School of Engineering Practice

The School of Engineering Practice proposed two new courses: *748 – Development of Local Sustainable Communities and *770 – Total Sustainability Management.

Dr. Deza moved, and Dr. McDermid seconded,

“that the Faculty of Engineering Graduate Curriculum and Policy Committee approve the new courses, School of Engineering Practice *748 and *770, as described above.”

The motion was carried.

There was no other business and the meeting adjourned at 1:20 p.m.



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Biomedical Engineering		
COURSE TITLE		Nanotechnology in Chemical Engineering		
COURSE NUMBER	795	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Dr. Todd Hoare		
PREREQUISITE(S)				

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? Y If YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.			
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:	
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form	
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:	
OTHER CHANGES	<input checked="" type="checkbox"/>	EXPLAIN: This course is to be cross-listed with Chemical Engineering *791	

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.
 Fundamentals of the design, preparation, and properties of nanomaterials are discussed from a chemical engineering perspective. Emphasis will be placed on how physical properties of materials change on the nanoscale, top-down (chemical patterning/lithography techniques) versus bottom-up (self-assembly) approaches to nanostructure preparation, nanoparticle design, characterization of nanoscale structures, nanofluidics and nanomachines (including microelectromechanical systems) and nanobiomaterials (drug and gene delivery, biosensors and bioseparations).

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.
 Nanostructure preparation, nanoparticle design, characterization of nanoscale structures, nanofluidics and nanomachines

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

Nanotechnology fits with the Biomedical Engineering program as we have many students from a Chemical Engineering background and also those who require chemical engineering for their research. BME currently has students taking this course as it helps with their research and program.

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the Extra Work to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Natalie Illingworth Email: illing@mcmaster.ca

Extension: 23486

Date submitted: Jan 16/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012

-----Original Message-----

From: Kathy Goodram [mailto:goodram@mcmaster.ca]

Sent: January-16-13 10:09 AM

To: Natalie Illingworth

Cc: swartzc@Gorash7.UTS.McMaster.CA; espiritu@Gorash7.UTS.McMaster.CA;

westmay@Gorash7.UTS.McMaster.CA; nosewor@Gorash7.UTS.McMaster.CA

Subject: Re: FW: BME courses

Hi Natalie,

The Department of Chemical Engineering approved your request to cross-list Chem Eng 791 "Nanotechnology in Chemical Engineering" as a BME course.

Also for your information, the Department has also approved the cancellation of Chem Eng 730, 733 and 780 which are all cross-listed with BME.

Regards,
Kathy

On Mon, 14 Jan 2013 15:36:45 -0500

"Natalie Illingworth" <illing@mcmaster.ca> wrote:

> Hi Kathy

>

>

> BME would like to cross-list Chem Eng 791 as a BME course also. Can

> you

get

> the appropriate approvals for this. I will complete the paperwork for

> submitting to Graduate Studies.

>

>

> Kind regards,

>

> Natalie

>

> =====

>

> Natalie Illingworth, CGA

>

> McMaster University

>

> Administrator, Graduate Schools

>

> Faculty of Engineering

>

> 1280 Main Street West - ETB405

>



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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DEPARTMENT/PROGRAM		Biomedical Engineering		
COURSE TITLE		Fluid Mechanics		
COURSE NUMBER	BME730	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)	Staff			
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Cross-listed with Chemical Engineering 730, they have cancelled the course		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Natalie Illingworth Email: illing@mcmaster.ca Extension: 23486 Date submitted: Jan 16/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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DEPARTMENT/PROGRAM		Biomedical Engineering		
COURSE TITLE		Computational Fluid Dynamics		
COURSE NUMBER	BME733	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)	Staff			
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Cross-listed with Chemical Engineering 733, they have cancelled the course		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
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PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Natalie Illingworth Email: illing@mcmaster.ca Extension: 23486 Date submitted: Jan 16/13

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SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

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DEPARTMENT/PROGRAM		Biomedical Engineering		
COURSE TITLE		Biomaterials and Tissue Engineering		
COURSE NUMBER	BME780	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		H. Sheardown/K. Jones		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Cross-listed with Chemical Engineering 780, they have cancelled the course		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
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6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Natalie Illingworth Email: illing@mcmaster.ca Extension: 23486 Date submitted: Jan 16/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Chemical Engineering						
NAME OF PROGRAM								
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. (x)	M.B.A. ()	M. Eng. (x)	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS			CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE			CHANGE IN COURSE REQUIREMENTS		
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			EXPLAIN:					
OTHER CHANGES	x	EXPLAIN: Elimination of Internship Program (M.Eng. or M.A.Sc.)						
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
There is a Master's Internship Program on the books, in which students take six one-term courses plus a research project carried out in industry (M.Eng.), or four one-term courses plus thesis carried out in industry (M.A.Sc.).								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
Elimination of the Internship Program.								

RATIONALE FOR THE RECOMMENDED CHANGE:

No student has enrolled in this program for at least 12 years. Many graduate research projects in the Department of Chemical Engineering involve a strong collaboration with industry; however, the regular M.Eng. and M.A.Sc. programs readily accommodate these projects. This program is therefore superfluous, and confusing to applicants.

PROVIDE IMPLEMENTATION DATE: (*Implementation date should be at the beginning of the academic year*)

Fall 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

No

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Dr. C.L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

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3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Chemical Engineering						
NAME OF PROGRAM								
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. (x)	M.B.A. ()	M. Eng. (x)	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS		x	CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE			CHANGE IN COURSE REQUIREMENTS		
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			EXPLAIN:					
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
<p>Academic Requirements: Minimum of B- average</p> <p>English Language Requirements: Minimum TOEFL score of 80 (550 on the paper-based TOEFL test or 213 on the computer-based TOEFL test), or IELTS score of 6.5</p>								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
<p>Academic Requirements: Minimum of B+ average in final 2 years of study</p> <p>English Language Requirements: Minimum TOEFL score of 85 (563 on the paper-based TOEFL test or 223 on the computer-based TOEFL test), or IELTS score of 6.5</p>								

RATIONALE FOR THE RECOMMENDED CHANGE:

To (i) raise the overall quality of graduate student admissions, and (ii) have admission requirements that are more consistent with competing Canadian Chemical Engineering Departments.

PROVIDE IMPLEMENTATION DATE: (*Implementation date should be at the beginning of the academic year*)

September 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: C.L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Advanced PSE Tools and Methods		
COURSE NUMBER	740	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (X)
INSTRUCTOR(S)		Thomas A. Adams II		
PREREQUISITE(S)				

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: Fall 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO If YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO If YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE:** CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form
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CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
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COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES		EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

Advanced techniques for modeling, design, and analysis of chemical processes. Techno-economic analyses. Synthesis and optimization of superstructures. Life cycle assessments. Combining computer-aided process engineering software for advanced problem solving approaches, such as GAMS, gProms, and Aspen Dynamics

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The course uses primarily instructor notes. However, some books will be recommended and available from the McMaster Library, some freely downloadable: They are (1) Jimenez-Gonzales C and Constable DJC. Green Chemistry and Engineering: A practical design approach. (2011) Wiley. (Selected chapters). (2) (2007), Stevenage IET. (2) Seider, Seader, Levin and Widago, Process and Product Design Principles, 3rd Ed, Wiley 2009. (3) Turton, Baillie, Whiting, and Shaeiwitz. Analysis, Synthesis, and Design of Chemical Processes, 3rd Ed, Prentice Hall 2009. (4) Towler and Sinnott. Chemical Engineering Design: Principles, Practice and Economics of Plant and Process Design. 2nd Ed, Elsevier 2012.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This course provides an overview of advanced process systems engineering tools and methods currently used in research. This will be helpful to any student in the process systems engineering (PSE) area, anyone interested in energy systems (including bio-based systems, mechanical engineers, etc), and anyone interested in solving complex mathematical problems. In addition, the course goes into detail about life cycle analyses, which are useful in a wide variety of fields. This fits in directly with the Department of Chemical Engineering's Process Systems Engineering core research area and the department's goal of expanding the course offerings in the areas of energy and sustainability.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>5-10 (10 were enrolled in the 702X course in 2012).</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Three 50-minute lectures occur per week, presentation style. Lectures may often involve workshop style tutorials in which students work along with the professor on their laptops using the latest simulation software.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>5 homework projects constitute the total course evaluation. Each project relates to one of the five units of interest, and will involve using computer software to solve complex problems. A different software tool is usually required for each project.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>There are no other overlapping courses to the best of my knowledge. However, it will complement well with SEP 702, SEP 706, ChE 754, and ChE 741 (proposed quarter-course)</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>N/A</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date: 01/18/2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

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2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Energy Systems Engineering		
COURSE NUMBER	741	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (X)
INSTRUCTOR(S)		Thomas A. Adams II		
PREREQUISITE(S)		None		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: Fall 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

Cradle-to-grave overview of major current and future energy conversion processes. Energy sources such as coal, natural gas, petroleum, biomass, uranium, wind, and solar. Fuel processing techniques such as Fischer-Tropsch synthesis, gasification, methane reforming, and CO2 reforming. Power generation technologies including steam turbines, gas turbines, wind turbines, fuel cells, and solar panels. Sustainability impact factors including water consumption, smog formation, and CO2 emissions. Advanced processing techniques such as combined cycles, turbine/fuel cell hybrids, and CO2 capture technologies. The focus is on breadth of knowledge and real-world use and application.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Four books plus around 30 primary sources (reports, papers, etc) are used as the course text. The books are all currently available for free PDF download via the McMaster Library: They are
 (1) Ghosh TK and Prelas MA. Energy Resources and Systems, Volume 1: Fundamentals and Non-Renewable Resources. (2009) Springer. (2) Spliethoff H. Power Generation from Solid Fuels. (2010) Springer (selected chapters). (3) Jimenez-Gonzales C and Constable DJC. Green Chemistry and Engineering: A practical design approach. (2011) Wiley. (Selected chapters). (4) Wood, Janet. Nuclear Power, (2007), Stevenage IET – selected chapters.
 Outline:
 Unit 1: Triple Bottom Line of Sustainability - Definition & Scope. Life cycle analysis. Eco-indicators
 Unit 2: Material Recovery & Processing - Coal & coal bed methane, Natural & shale gas, petroleum, biomass.
 Unit 3: Modern Bulk Power Production - Coal combustion (subcritical and supercritical pulverized coal), Natural gas combustion and combined cycles, Coal gasification and combined cycles, Nuclear reactors, non-bio renewables (wind, solar).
 Unit 4: Advanced Bulk Power Production - Solid oxide fuel cells, oxyfuels, & chemical looping
 Unit 5: Thermochemical conversion to liquid fuels - Refining, Synthetic Fuels, Alternative Fuels, and Polygeneration.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This course provides an overview of the most essential energy conversion processes in use today. This will be helpful to any student performing research in the area of energy processing or energy technology. This fits in directly with the Department of Chemical Engineering's Process Systems Engineering core research area and the department's goal of expanding the course offerings in the areas of energy and sustainability</p>
<p>2. EXPECTED ENROLMENT:</p> <p>about 10. 12 students originally enrolled in the 2012 trial course (702W)</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Three 50-minute lectures occur per week, presentation style. Active Discussion is facilitated during each lecture.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Homework, 66% (six assignments) - Each are approximately 1 page responses to challenging, open-ended questions. Students are encouraged to draw upon their unique backgrounds and experiences. Research Proposal: 34% - Students must prepare a 5 page "NSERC Discovery" proposal on a topic of their choice which addresses some chosen issue relative to the energy supply chain studied in this course.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>There are no other overlapping courses to the best of my knowledge. However, it will complement well with SEP 702, SEP 706, ChE 754, and ChE 740 (proposed quarter-course)</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>N/A</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date: 01/18/2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

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2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Nanotechnology in Chemical Engineering		
COURSE NUMBER	791	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Dr. Todd Hoare		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? Y IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input checked="" type="checkbox"/>	EXPLAIN: This course will be cross-listed as Biomedical Engineering *795.		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. Fundamentals of the design, preparation, and properties of nanomaterials are discussed from a chemical engineering perspective. Emphasis will be placed on how physical properties of materials change on the nanoscale, top-down (chemical patterning/lithography techniques) versus bottom-up (self-assembly) approaches to nanostructure preparation, nanoparticle design, characterization of nanoscale structures, nanofluidics and nanomachines (including microelectromechanical systems) and nanobiomaterials (drug and gene delivery, biosensors and bioseparations).				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used. Nanostructure preparation, nanoparticle design, characterization of nanoscale structures, nanofluidics and nanomachines				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

Nanotechnology fits with the Biomedical Engineering program as we have many students from a Chemical Engineering background and also those who require chemical engineering for their research. BME currently has students taking this course as it helps with their research and program.

2. EXPECTED ENROLMENT:

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the Extra Work to be required of graduate students, i.e., exams, essays, etc.)

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: C. Swartz Email: swartzc Extension: 27945

Date submitted: Jan 16/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

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DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Fluid Mechanics		
COURSE NUMBER	730	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If Yes, Provide the Date:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Course was last taught in 2004-2005. Instructor (J. Vlachopoulos) has since retired.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Computational Fluid Dynamics		
COURSE NUMBER	733	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Course has not been taught since 2000.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

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3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Advanced Mathematics in Chemical Engineering		
COURSE NUMBER	751	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If Yes, Provide the Date:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Has not been taught in more than 12 years.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Dynamic Optimization		
COURSE NUMBER	755	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Intended to be taught primarily by Dr. Benoit Chachuat whose expertise was in this area. He resigned from McMaster in 2010.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

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2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Chemical Engineering		
COURSE TITLE		Biomaterials and Tissue Enineering		
COURSE NUMBER	780	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		H. Sheardown, K. Jones		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form	
CHANGE TO FULL COURSE		<input type="checkbox"/>	CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Course was taught only once (in 2005-2006). Instructors agree that course is not likely to run again.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: Dr. Christopher L.E. Swartz Email: swartzc@mcmaster.ca Extension: 27945 Date submitted: 01/18/2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Civil Engineering						
NAME OF PROGRAM		Doctor of Philosophy						
PROGRAM DEGREE	Ph.D. (X)	M.A. ()	M.A.Sc. ()	M.B.A. ()	M. Eng. ()	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS			CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE		X	CHANGE IN COURSE REQUIREMENTS		
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			X	EXPLAIN:				
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
See attached excerpt for Department of Civil Engineering Graduate Student Handbook - outlining the current procedures for our Ph.D. Comprehensive Examinations.								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
See Attached documentation labeled "Department of Civil Engineering's Comprehensive Examination Format" dated November 2013.								
The highlighted sections are new portions.								

RATIONALE FOR THE RECOMMENDED CHANGE:

The purpose of the comprehensive exam, as stated in the Graduate Studies Calendar is "... to test the candidate's acquisition of the knowledge and maturity of approach to problems in the major field of study, as well as in appropriately chosen cognate subject areas. ". The Department of Civil Engineering Ph.D. Comprehensive Examination Regulations state the same purpose, and go on further to say that "... It is intended that this examination will also be used to test the candidate's competence and ability to conduct research in the chosen specialty."

PROVIDE IMPLEMENTATION DATE: (Implementation date should be at the beginning of the academic year)

September 1, 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

The Ph.D. Comprehensive Examination will be in two parts. Part A is to test the candidate's knowledge, both breadth and depth, of undergraduate material in the major field of student, with graduate level understanding and the ability to think independently. This portion is to be completed within 8 - 10 months, but not exceeding 12 months, of admission to the doctoral program. Part B is to test the candidate's competence and ability to conduct research in a chosen specialty. This part must be completed within 12-20 months of admission to the doctoral program, subject to passing Part A. Both parts of this examination include a written and oral portion. For further details, please see the Department of Civil Engineering Graduate Student Handbook.

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Ioannis Tsanis Email: tsanis@mcmaster.ca Extension: 24415 Date submitted: December 3, 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

Excerpt from the Department of Civil Engineering Graduate Student Handbook

DEPARTMENT OF CIVIL ENGINEERING

McMaster University

Hamilton, Ontario

Ph.D. COMPREHENSIVE EXAMINATION REGULATIONS

1. Purpose

The purpose of this examination is to test the candidate's acquisition of knowledge and maturity of approach to problems in the major field of study, as well as in appropriately chosen cognate subject areas. It is intended that this examination will also be used to test the candidate's competence and ability to conduct research in the chosen speciality.

2. Membership of the Ph.D. Examination Committee

The Ph.D. Examination Committee shall consist of a non-voting Chair of the Committee, and four voting members as follows: two representatives from the candidate's supervisory committee (this representation will be decided by the members of the supervisory committee), and two department representatives who are not part of the candidate's Supervisory Committee.

In case of a re-examination the provision of 6(b) shall also apply.

3. Chair of the Ph.D. Examination Committee

This position shall be taken by rotation of the Department faculty. The candidate's supervisor(s), the Graduate Student Advisor or the Department Chair shall in no instance be the Ph.D. Examination Committee Chair. The role of the Committee Chair is fundamentally administrative, and does not include voting rights regarding examination outcome.

4. (a) Timing

The examination will normally be scheduled during the September to May period at a time that is mutually satisfactory to both the candidate and the members of the Ph.D. Examination Committee. The examination will normally take place between 12 and 20 months after registration in the Ph.D. programme, with an upper limit of 24 months. It is the responsibility of the Supervisory Committee to recommend to the Department, at least two months in advance, that a candidate is ready to take the examination. Upon receipt of that recommendation, the Ph.D. Examination Committee Chair shall establish the date of the examination.

(b) Research Proposal

Prior to the examination, the candidate is required to prepare the Ph.D. Research Proposal. The research proposal must be submitted at least 3 weeks before the scheduled date of the first Ph.D. Examination Committee meeting (to set the questions) and it must include the signature(s) of the supervisor(s) indicating their approval.

The proposal is to be a maximum of 25 pages long (12 pt Times New Roman font and double line spacing) and must address the following: (i) the scope and objectives of research,(ii) a *brief* literature review with the reference list, (iii) methods and proposed approach, (iv) schedule of activities.

(c) Notification

Each candidate shall receive, from the Committee Chair, written notification of the examination date at least one (1) month in advance. It is the responsibility of the Supervisory Committee to fully explain the importance, intent and scope of the examination, and to identify the preparation required for it.

5. Form of Examination

The examination shall consist of a written and an oral component. The written component of the examination will take the form of a "take-home" examination; the candidate shall have seven (7) days to complete the examination. Members of the Ph.D. Examination Committee shall agree on the form and content of this examination; the emphasis shall be on comprehension rather than on detail. The meeting for setting the written part of the examination will be convened by the Graduate Student Advisor.

Upon submission of the written answers, the Committee shall conduct an oral examination with the candidate no later than one week after completion of the written part.

6. Outcome of the Examination

There shall be only two possible outcomes of the Ph.D. Comprehensive Examination. The Committee shall render one of the following decisions:

- (a) when there are three or more positive votes then the Committee rules that the candidate passed the examination. The Committee assesses the performance with a designation of "Pass";
- (b) when there are two or more dissenting votes there shall be a re-examination within six (6) months. In the event of are-examination a fifth voting member, from the Department shall be appointed to the Committee by the Department Chair. There shall be only one re-examination.

7. Notification of Outcome

The Chair of the Ph.D. Examination Committee shall verbally inform the candidate of the Committee's decision based on one of the two possible outcomes above. That decision shall be conveyed to the candidate immediately after the Committee has concluded discussion.

Formal written notification of the Committee ruling will be provided by the Graduate Student Advisor upon receipt of the Committee report.

Department of Civil Engineering's Comprehensive Examination Format New Version – November 2013

Purpose:

The purpose of the comprehensive exam, as stated in the *Graduate Studies Calendar* is "... to test the candidate's acquisition of the knowledge and maturity of approach to problems in the major field of study, as well as in appropriately chosen cognate subject areas. ". *The Department of Civil Engineering Ph.D. Comprehensive Examination Regulations* state the same purpose, and go on further to say that "... It is intended that this examination will also be used to test the candidate's competence and ability to conduct research in the chosen specialty."

Examination Committee Membership and Chair of the Ph.D. Examination Committee

The Ph.D. Examination Committee shall consist of a non-voting Committee Chair, and **three voting members** as follows: the supervisor, one representative from the candidate's supervisory committee (this representation will be decided by the members of the supervisory committee), and one departmental representative who is not part of the candidate's Supervisory Committee.

The position of the Examination Committee Chair shall be taken by rotation of the departmental faculty. The candidate's supervisor(s), the Graduate Student Advisor or the Department Chair shall in no instance be the Ph.D. Examination Committee Chair.

Format:

The comprehensive exam will consist of two parts.

- **Part A: Breadth and Depth of Knowledge**

Objective: The objective of Part A is to test the candidate's knowledge, both breadth and depth, of undergraduate material in the major field of study, with graduate level understanding and the ability to think independently.

Time: within **8 -10 months, but not exceeding 12 months**, of admission to the doctoral program.

Written part: This is an open-book/closed-door examination, with three questions in three selected subject areas for 4 hours. Each committee member will provide a 1-2 hour question in which the candidate will have to demonstrate a graduate-level understanding of undergraduate material in **three areas selected by the Examination Committee from an approved list or that as approved by the Examination Committee**. All open book material shall be provided by the Examination Committee member who poses the question. The three tested areas will be informed to the candidate **at least two months** prior to the exam.

Oral part: The oral exam is scheduled on the next business day following the written part. The candidate should provide a brief presentation (maximum of 15 minutes) of the answers to the three written questions, and then answer questions from the Committee members.

The oral examination will mostly be based on the questions from the written part of the examination. Each examiner is to focus on the question that they have formulated themselves. Committee members can also ask questions for problems that were set by other members of the examination committee. However, the scope of the oral part may extend to examining the depth of knowledge in the candidate's discipline area and possible deficiencies in the candidate's academic background.

This part of the examination shall be conducted in two rounds consisting of 10-15 minutes of questions from each of the three Examination Committee members. The oral exam shall not exceed two hours in duration.

- **Part B: Research Proposal and Oral Exam**

Objective: The objective of Part B is to test the candidate's competence and ability to conduct research in the chosen specialty.

Time: within **12-20 months** of admission to the doctoral program, subject to passing Part A.

Written part: The candidate shall submit a research proposal approved by the supervisory committee, up to a maximum of 25 pages in length.

Oral part: The candidate will be required to present the research proposal in a summary fashion (approximately 20 minutes) to the committee, followed by questions directly related to the proposal and the candidate's specific area of research. The oral part is an open examination and shall not exceed two hours in duration.

Evaluation: Similar to the existing model.

Outcome of the Examination:

There shall only be three possible outcomes of the first Ph.D. Comprehensive Examination. The committee shall render one of the following decisions:

1. When there are two or more passing votes then the Committee rules that the candidate passed the examination. The Committee assesses the performance with a designation of 'Pass'.
2. When there are two or more passing votes, then the committee rules that the candidate passed the examination, but may add conditions to this pass to correct any weaknesses detected (e.g., take a specific course).
3. When there are two or more "Unsatisfactory" votes there shall be **a re-examination within three months**. In the event of a re-examination, one new member shall be added to the original examination committee and three or more passing votes are required for the candidate to pass the examination.

There shall only be three possible outcomes of a re-examination. The committee shall render one of the following decisions:

1. When there are two or more positive votes then the Committee rules that the candidate passed the examination. The Committee assesses the performance with a designation of 'Pass'.
2. When there are two or more positive votes, then the committee rules that the candidate passed the examination, but may add conditions to this pass to correct any weaknesses detected (e.g., take a specific course).
3. When there are two or more "Unsatisfactory" votes the candidate will fail. The Committee assesses the performance with a designation of 'Fail'. The candidate will be required to withdraw from the Ph.D. programme.

The Evaluation and Outcome of the Examination apply to both parts of the examination.

Suggested list of subject areas:

- (1) Engineering Analysis/Computational Mechanics
- (2) Structural/Geotechnical Engineering
- (3) Water/Environmental Engineering
- (4) Socio-economic & Management



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
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DEPARTMENT/PROGRAM		CIVIL ENGINEERING		
COURSE TITLE		Seismic Isolation and Structural Control		
COURSE NUMBER	727	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Dimitrios Konstantinidis		
PREREQUISITE(S)		structural dynamics (CIV ENG 4SD4/6SD4, or CIV ENG 716/717, or equivalent)		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: January 2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE:** CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

This course covers the analysis and design of structural systems that feature seismic isolation and/or structural control devices. The course will cover: (a) Conceptual basis of seismic isolation, seismic isolation types, mechanical characteristics of isolators; (b) Behaviour and modeling of isolation devices, response of structures with isolation devices; (c) Conceptual basis for structural control devices, types of dampers, mechanical behaviour and modeling of dampers; and (d) Design approaches and code requirements for structures using seismic isolation and energy dissipation devices.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

1. BASIC PRINCIPLES OF SEISMIC ISOLATION AND STRUCTURAL CONTROL
2. SEISMIC ISOLATOR TYPES
3. MECHANICS OF SEISMIC ISOLATORS
4. MODELING OF HYSTERETIC BEHAVIOUR
5. STRUCTURAL CONTROL DEVICES
6. DYNAMIC VIBRATION ABSORBERS
7. CURRENT DESIGN PROCEDURES / CODE REQUIREMENTS

There will not be a required textbook. Handouts, papers, and reports will be made available in class.

Recommended References:

- Naeim, F. and Kelly, J. M. Design of Seismic Isolated Structures: From Theory to Practice. Wiley, 1999.
- Kelly, J. M. and Konstantinidis, D. A. Mechanics of Rubber Bearings for Seismic and Vibration Isolation. Wiley, 2011.
- Higashino, M. and Okamoto S. Response Control and Seismic Isolation of Buildings. CRC Press, 2006.
- Soong, T. T. and Dargush, G. F. Passive Energy Dissipation Systems in Structural Engineering. Wiley, 1997.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>The course ties in very well with the rest of the graduate courses offered in the structural/earthquake engineering program, especially CE 6SD4 (Structural Dynamics and Earthquake Engineering), CE 716 (Structural Dynamics), CE 717 (Dynamics of Structural Systems), and CE 730 (Earthquake Engineering).</p>
<p>2. EXPECTED ENROLMENT:</p> <p>6 - 10</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <ul style="list-style-type: none"> • Lectures • Handouts/Reading material • Discussions
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Homework Assignments 30% Midterm 20% Final Exam 20% Term Project 30%</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>No</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>This course is intended primarily for students within the Civil Engineering Department</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Dimitrios Konstantinidis Email: konstant@mcmaster.ca Extension: 27281 Date submitted: Jan 14, 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

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1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Civil Engineering		
COURSE TITLE		Advanced water and wastewater treatment processes		
COURSE NUMBER	735	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Younggy Kim		
PREREQUISITE(S)		ENG4V04, CE4V04		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: Sep 2013 / Jan 2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form
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CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
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COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES		EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

Introduction of advanced treatment processes in water and wastewater treatment. 1. Membrane filtration systems: microfilters and ultrafilters in drinking water treatment; membrane bioreactors in wastewater treatment; nanofiltration and reverse osmosis in desalination and water reclamation; ion-exchange membrane applications. 2. Advanced oxidation processes: OH radical reactions; kinetics of radical chain reactions; OH radical production using ozone, hydrogen peroxide, ultra violet radiation, and photocatalysis. 3. Bioelectrochemical systems for wastewater treatment: thermodynamics and kinetics of electrode reactions; ionic transport under electric fields; exoelectrogenic bacteria; microbial fuel cells; microbial electrolysis cells; electroanalytical techniques using potentiostats.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

- Pressurized membrane systems
- Ion-exchange membrane systems
- Advanced oxidation processes
- Bioelectrochemical systems
- Electrochemistry and electroanalytical techniques

Text: D. Lawler, M. Benjamin, "Water quality engineering: Physical and chemical treatment processes" (new edition) McGraw-Hill

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This course will introduce advanced and emerging technologies for water and wastewater treatment. In recent years, many of treatment facilities start employing advanced treatment processes (e.g., membrane filtration, advanced oxidation, and membrane bioreactors) for reliable effluent water qualities. Students in the course will learn such new and emerging treatment processes. Students will also have a clear understanding on current issues and trends in drinking water treatment, wastewater treatment, and water reclamation.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>5-10 graduate students</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Lectures, seminars</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Mid-term exam (40%) Final exam (40%) Term projects and assignments (20%)</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>No</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>This course is intended primarily for students within the Department of Civil Engineering</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Younggy Kim Email: younggy@mcmaster.ca Extension: 24802 Date submitted: Dec 3, 2012</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Computing and Software		
COURSE TITLE		Certified Programming with Dependent Types		
COURSE NUMBER	CAS 763	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Wolfram Kahl		
PREREQUISITE(S)		Registration in one of the graduate programs in the department of Computing and Software, or permission of instructor		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: 2013/2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE CURRENT COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.
 Type systems featuring types depending on values empower not only logics that can capture common mathematical formalisations more naturally than conventional first-order or higher-order logics; they also empower programming languages where specifications may be incorporated into the type of programs, and well-typed programs are thus guaranteed to satisfy these specifications. Students will learn at least one dependently-typed programming language in depth. The course will also cover associated foundations, including relevant type theories and the Curry-Howard correspondence, as well as useful patterns of formalising, programming, and proving in dependently-typed programming languages.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.
 Topics:

- Basic data type definitions; functional programming with pattern matching
- The Curry-Howard correspondence: Formulae as types, proofs as data
- Proving properties of functional programs
- Indexed datatypes
- Simple certified programs: Incorporating specifications into types
- Invariant-carrying datatypes
- Representing typed data: Expression languages, logics and programming languages
- Dependently-typed programming patterns: Universes, Views
- Category-theoretic abstractions as typed interfaces

The main language will initially be Agda; other languages to be considered currently include Coq and Idris.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This course is accessible to Master-level students, and useful for all of our typical PhD population in providing them with concrete skills and knowledge useful for certified software construction and formal mathematical developments.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>5-25</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>The foundations and initial teaching of the main language will be lecture-centred; the later part of the course will cover more diverse topics and student projects mostly in seminar style.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION: (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>The foundations and initial teaching of the main language will be lecture-centred; the later part of the course will cover more diverse topics and student projects mostly in seminar style.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Antoine Deza Email: deza@mcmaster.ca Extension: 23750 Date: January 15, 2010</p>

If you have any questions regarding this form, please contact the Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/December 2006



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Computing and Software		
COURSE TITLE		Advanced Topics in Data Management		
COURSE NUMBER	CAS 764	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Fei Chiang		
PREREQUISITE(S)		Registration in one of Computing and Software graduate programmes or permission of instructor		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: 2013/2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

This course introduces advanced topics in data design, and techniques for managing inconsistent data for improved search and data analysis. Topics covered include data design principles, constraints, normalization, entity resolution, statistical data measures, and information theory. We introduce algorithms for repairing inconsistencies in the data, and for answering queries in the presence of these inconsistencies.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Inconsistent data is a widespread problem affecting many application domains. Having poor quality data leads to untrusted and ineffective data analysis. In this course, we introduce measures and techniques from statistics, dependency theory, and information theory that measure information quality. We will review algorithms from the research literature that manage inconsistent data, study their complexity, and contrast them for areas of improvement. We will primarily refer to recent research papers, as well as the book 'Data quality: Concepts, methods and techniques' (C. Batini and M. Scannapieco).

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>Modern information systems have seen an increasing abundance of data in recent years. However, there is a shortage of analysts and developers who can glean meaningful insights from this data. Having an introductory knowledge of database systems / data management is now standard in computer science undergraduate education. This course builds upon the introductory database course to provide a deeper understanding of the issues surrounding management, querying, and analysis of modern, heterogeneous data.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>10-20</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Introductory lectures by the instructor, followed by student presentation of research papers, which will generate follow-on discussion of the paper.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>a) Each student will present at least 1-2 papers (depending on enrollment), and will be evaluated on the quality of their presentation b) All students are expected to read the paper being presented and will submit a paper summary and critique each week for evaluation c) All students will work on a course project that will aim to solve a small research problem in the area</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: deza@mcmaster.ca Email: deza@mcmaster.ca Extension: 23750 Date: January 15, 2010</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Computing and Software		
COURSE TITLE		Wireless Networking and Mobile Computing		
COURSE NUMBER	CAS 765	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Rong Zheng		
PREREQUISITE(S)		Registration in one of Computing and Software graduate programmes or permission of instructor		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: 2013/2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form
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CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
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COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES		EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

This course introduces fundamental concepts, state-of-the-art research and applications of wireless networking and mobile computing. Topics covered include wireless network protocols, wireless standards, location-based services and techniques, security, and programming on mobile platforms.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

The past decade witnesses an explosion of wireless enabled devices, wireless data services and deployment of wireless network infrastructure. Together, they enable anywhere, anytime information access and computing. The course aims to expose students to the basic principles, research development and industrial practices in wireless networking and mobile computing. The topics include:

- 1) wireless network protocols and standards
- 2) Location based services and techniques
- 3) Wireless security
- 4) Mobile application development

The primary source of course materials is research papers and tutorial materials in the area.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>Wireless networking and mobile computing is a fast changing field in both research and industrial practice. Tremendous growth has been observed in the past decade in both the number of wireless-enabled devices in the market and the data rate supported by wireless access technologies. Furthermore, we have seen emerging applications beyond conventional data services in the form of Internet of Things such as home automation, smart grids, connected vehicles, and mobile health. Students who have taken undergraduate networking courses are equipped with a basic understanding of the network protocol stack. However, there exist many gaps in terms of knowledge in i) Internet protocol stack vs. new wireless networking standards; ii) Human-to-machine communication vs. machine-to-machine communication, and iii) computer networking principles vs. mobile computing systems/applications. The course aims to fill in these gaps. It is accessible to Master's students, and useful to PhD students pursuing research in the area of wireless networking and mobile computing.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>10-20</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>The course is a combination of lectures by the instructor and guest lecturers, paper presentation by the students and semester-long projects organized in groups.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>a) Each student will present at least 1-2 papers (depending on enrollment), and will be evaluated on the quality of their presentation. b) All students are expected to read the paper being presented and will submit a paper summary and critique each week for evaluation. c) All students will work on a course project that will aim to develop novel solutions to open research problems or build prototype systems.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>No</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: deza@mcmaster.ca Email: deza@mcmaster.ca Extension: 23750 Date: January 15, 2010</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

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2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		ECE		
COURSE TITLE		Electromagnetic Scattering from Random Media		
COURSE NUMBER	*776	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Dr. Tim Field		
PREREQUISITE(S)		A strong background in theory of stochastic processes is essential		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: January 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input checked="" type="checkbox"/>	EXPLAIN: Needs new course number. Previously offered as *748 - Special Topics in Microelectronics.		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. The principle themes are to characterize the time evolution of the scattered field in terms of stochastic differential equations, and to illustrate this framework in simulation and experimental data analysis. The physical models contain all correlation information and higher order statistics, which enable radar and laser scattering experiments to be interpreted. An emphasis is placed on the statistical character of the instantaneous fluctuations, as opposed to ensemble average properties. This leads to various means for detection, which have important consequences in radar signal processing and statistical optics. There are also significant connections with ideas in mathematical finance that can be applied to physics problems in which non-Gaussian noise processes play an essential role.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used. Please see attached				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>To develop the students' understanding of the dynamical theory of scattering from random media, from a first principles idea.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>10</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>One three-hour lecture per week</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Written exam 50% Simulation project (special topics) 50%</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>N/A</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>N/A</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Kerri Hastings Email: hastings@mcmaster.ca Extension: 24826 Date: Nov. 21/12</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011

Electromagnetic Scattering from Random Media ~~748~~

Instructor:

Dr. Timothy Field
Office: ITB_XXX, ext. xxx
Email: xx@mcmaster.ca
Web: <http://ece.mcmaster.ca/>

Course format:

Advanced graduate level course based on topics from the instructor's recent monograph. Scheduled weekly classes cover core topics (Part I) and also provide opportunity for consultation on selected special topics (Parts II & III) to be agreed between student and instructor.

Required Text:

*Electromagnetic Scattering from Random Media*¹
Timothy R. Field
Oxford International Series of Monographs on Physics, 144
ISBN13: 978-0-19-857077-6, ISBN10: 0-19-857077-5

Perspective:

The course aims to develop the student's understanding of the dynamical theory of scattering from random media, from a first principles perspective.

The principal themes are to characterize the time evolution of the scattered field in terms of stochastic differential equations, and to illustrate this framework in simulation and experimental data analysis. The physical models contain all correlation information and higher order statistics, which enables radar and laser scattering experiments to be interpreted. An emphasis is placed on the statistical character of the instantaneous fluctuations, as opposed to ensemble average properties. This leads to various means for detection, which have important consequences in radar signal processing and statistical optics. There are also significant connections with ideas in mathematical finance that can be applied to physics problems in which non-Gaussian noise processes play an essential role.

This course promotes a significant advance in this field, and should prove valuable to advanced postgraduate and postdoctoral researchers in engineering, physics and mathematics.

¹ Limited number of copies available from the author.

List of Topics: **Core topics to be covered from Part I and selected topics from Parts II & III**

I. STOCHASTIC CALCULUS

1. Heat equation and Brownian motion
2. Ito calculus
3. Stochastic differential geometry
4. Examples of stochastic differential equations

II: SCATTERING DYNAMICS

5. Diffusion models of scattering
6. Rayleigh scattering
7. Population dynamics
8. Dynamics of K -scattering
9. Models of weak scattering
10. Scattering from general populations

III: SIMULATION AND EXPERIMENT

11. Simulation of K -scattering
12. Experimental tests
13. Non-linear dynamics of sea clutter
14. Observability of scattering cross-section

Additional specialized topics of relevance

- A. Stability and infinite divisibility
- B. Ito versus Stratonovich stochastic integrals
- C. Filtrations, conditional probability and Markov property
- D. Girsanov's theorem
- E. Partition function solution to BDI model
- F. Summary of K -scattering
- G. Iterative solution for vector processes
- H. Open problems
- I. Suggested further reading

In addition students may be advised to consult pertinent research papers cited in the text according to their chosen topics.

Evaluation Method: Written examination (core) 50% / simulation project (special topics) 50%.

Prerequisites: Strong background in theory of stochastic processes is essential.

Term 2



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Engineering Physics						
NAME OF PROGRAM		M.A.Sc						
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. (X)	M.B.A. ()	M. Eng. ()	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS			<input type="checkbox"/>	CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE		<input type="checkbox"/>	CHANGE IN COURSE REQUIREMENTS	
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			<input checked="" type="checkbox"/>	EXPLAIN: The wording for the required number of courses for the M.A.Sc program needs to be the same wording that they have for the PhD.				
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
The requirements for M.A.Sc program currently states in the calendar: "A candidate for the M.A.Sc.degree is required to complete a minimum of three half courses (the equivalent of one full course must be at the 700-level) with an average of at least B and a thesis."								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
We would like to change the above statement to the following: "A candidate for the M.A.Sc.degree is required to complete a minimum of three half course, at least two of which must be at the 700 level, with an overall average of at least B and a thesis."								

RATIONALE FOR THE RECOMMENDED CHANGE:

It is confusing for students when it states "(the equivalent of one full course must be at the 700 level)"when all Engineering Physics courses are half courses

PROVIDE IMPLEMENTATION DATE: (*Implementation date should be at the beginning of the academic year*)

September 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

Change the calendar to read : "A candidate for the M.A.Sc.degree is required to complete a minimum of three half course, at least two of which must be at the 700 level, with an overall average of at least B and a thesis."

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: R. LaPierre

Email: lapierr

Extension: 27764

Date submitted: Jan 15/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Engineering Physics						
NAME OF PROGRAM		M.Eng						
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. ()	M.B.A. ()	M. Eng. (X)	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS		<input type="checkbox"/>	CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE		<input type="checkbox"/>	CHANGE IN COURSE REQUIREMENTS		
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			<input checked="" type="checkbox"/>	EXPLAIN: The wording for the required number of courses for the M.Eng program needs to be the same wording that they have for the PhD.				
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
The calendar currently states "A candidate for the M.Eng.degree (Industrial Internship) is required to complete a minimum of two full courses (the equivalent of one full course must be at the 700-level)."								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
We would like to change the above calendar statement to the following: "A candidate for the M.Eng.degree (Industrial Internship) is required to complete a minimum of four half courses (the equivalent of two half courses must be at the 700-level)."								

RATIONALE FOR THE RECOMMENDED CHANGE:

It is confusing for students when all Engineering courses are half courses.

PROVIDE IMPLEMENTATION DATE: (*Implementation date should be at the beginning of the academic year*)

September 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

We would like to change the above calendar statement to the following: "A candidate for the M.Eng.degree (Industrial Internship) is required to complete a minimum of four half courses (the equivalent of two half courses must be at the 700-level)."

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: R. LaPierre

Email: lapierr

Extension: 27764

Date submitted: Jan 15/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Engineering Physics		
COURSE TITLE		Semiconductor Manufacturing Technology		
COURSE NUMBER	6Z03	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Leyla Soleymani		
PREREQUISITE(S)				

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? YES	IF YES, PROVIDE THE DATE: January 2013	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? YES IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.					
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:			
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form			x
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE	
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:			
OTHER CHANGES		EXPLAIN:			

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

Detailed description of fabrication technologies used in the semiconductor industry; computer modelling of device fabrication; analysis of device performance.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Topics:

- Introduction to the Semiconductor Technology
- Properties of Semiconductor Materials
- Device Background
- CMOS Technology
- Crystal Growth and Wafer Fabrication
- Cleanrooms
- Lithography
- Oxidation and annealing
- Ion Implantation
- Diffusion
- Etching
- Thin Film Deposition

Principal Texts:

"Silicon VLSI Technology", J D Plummer, M D Deal, and P B Griffin, Prentice-Hall, 2000

"Introduction to Microelectronic Fabrication: Volume 5 of Modular Series on Solid State Devices", Richard C. Jaeger, second edition, Prentice Hall, 2002

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)

Engineering Physics:

There is a strong focus in the department, in terms of teaching and research, in the fields of semiconductor devices and micro/nanofabrication. This course provides the relevant information in fabrication of semiconductor devices, modelling their fabrication process and their device performance. As a result, it is essential for undergraduate and graduate students who will be working in the micro/nanofabrication or semiconductor fields to take a class in semiconductor manufacturing technology in addition to courses in Introduction to Microsystems devices (3MD3), Electronics (PHYS 3BA3, 3BB3), and Semiconductor Junction Devices (3PN4).

Biomedical Engineering:

There is an increasing number of researchers who are exploring the areas of micro/nanotechnology for fabricating the next generation of biomedical devices. As a result, cross-listing this course with the school of biomedical engineering will reach these graduate students.

2. EXPECTED ENROLMENT:

Graduate + Undergraduate: 20 Students

3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):

The course will be presented via 2 classroom-based lectures per week and 1 computer cluster-based lecture per week. In addition, three invited guest lectures will be organized.

4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the Extra Work to be required of graduate students, i.e., exams, essays, etc.)

Participation	5%
Assignments	10%
Midterm exam	15%
Oral presentation	10%
Silvaco project	20%
Final exam	40%
Total	100%

*This applies to students registered in 4Z03 only. 6Z03 students will be evaluated as (Oral presentation (20%), SILVACO project (40%), Final exam (40%). The SILVACO simulation project for 6Z03 students will be significantly more challenging and related to the design problems they encounter in their research.

5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).

No

6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?

Support from Biomedical Engineering

PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Leyla Soleymani Email: Soleyml@mcmaster.ca Extension: 27204 Date submitted: Jan 18, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		ENGINEERING PHYSICS		
COURSE TITLE		NUCLEAR REACTOR ANALYSIS		
COURSE NUMBER	EP6D03	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)	B. Rouben			
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? X If YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM <u>EACH</u> DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input checked="" type="checkbox"/>	PROVIDE THE NEW COURSE TITLE: NUCLEAR REACTOR PHYSICS		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). Engineering Physics 6D03 is cross-listed with UNENE UN0802
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: VICTOR SNELL Email: vgssolutions@rogers.com Extension: 20168 Date submitted: December 19, 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		UNENE PROGRAM - ENGINEERING PHYSICS		
COURSE TITLE		NUCLEAR REACTOR ANALYSIS		
COURSE NUMBER	UN0802	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		B. Rouben		
PREREQUISITE(S)		Student must be enrolled in UNENE Program		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE		DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If Yes, Provide the Date:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? X If Yes, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM <u>EACH</u> DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	X	PROVIDE THE NEW COURSE TITLE: Nuclear Reactor Physics		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE	
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>Core Course</p>
<p>2. EXPECTED ENROLMENT:</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>UN802 is cross-listed as Engineering Physics 6D03</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: VICTOR SNELL Email: vgssolutions@rogers.com Extension: 20168 Date submitted: December 19, 2012</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSE		
COURSE TITLE		XRD2 AND XRD3 DIFFRACTION METHODS FOR MATERIALS		
COURSE NUMBER	730	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (X)
INSTRUCTOR(S)		JAMES F. BRITTEN (CHEM & CHEM BIO)		
PREREQUISITE(S)		CHEM 730 (DIFFRACTION THEORY) OR EQUIVALENT		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: Winter 2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. This course is a study of 2D and 3D X-ray diffraction for the characterization of crystalline solid materials. We will examine the diffraction information obtained in phase, texture and residual stress analyses of metals, coatings, thin films, polymers, etc. using area detector techniques. We will look at safety, sample preparation, data processing software and interpretation of results. The students will study their own research samples and present their analyses to the class.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used. TOPICS: X-RAY DIFFRACTION, PHASE ANALYSIS, TEXTURE ANALYSES, RESIDUAL STRESS ANALYSES, SAXS. THE MAIN TEXT WILL BE BOB HE'S "TWO DIMENSIONAL X-RAY DIFFRACTION" (WILEY)				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>MATERIAL CHARACTERIZATION BY X-RAY - STRATEGIES, SOFTWARE, DATA INTERPRETATION, ETC.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>12</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>6 - 3 HOUR CLASSES & HANDS-ON INSTRUMENT TIME - 4 CLASSES - LECTURE & DEMO, 2 CLASSES - STUDENT PROJECTS</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>60% FOR RESEARCH PROJECT & PRESENTATION, 30% ASSIGNMENT, 10% PARTICIPATION</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: J. BRITTEN Email: xman@ Extension: 23107 Date submitted: January 18/13</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
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DEPARTMENT/PROGRAM		Materials Science & Engineering		
COURSE TITLE		Electrochemical Techniques: Theory & Applications		
COURSE NUMBER	745	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (X)
INSTRUCTOR(S)		Joey Kish		
PREREQUISITE(S)		None		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: 2013-2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form	
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE

COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES	<input checked="" type="checkbox"/>	EXPLAIN: This course was offered as a Special Topics course (MATLS 791#) in the Fall of 2011-2012. It is proposed that this Special Topics Course be added to the Graduate Calendar as a regular course.
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.
 This course is concerned primarily with a fundamental discussion of the major electrochemical techniques to familiarize the students with the associated set of relative strengths and limitations. Specific topics addressed include structure of the electrified interface, Butler-Volmer equation for electrode dynamics, reference electrodes, hydrodynamic electrodes, linear sweep & cyclic voltammetry, potentiodynamic polarization and electrochemical impedance spectroscopy. A selection of student-led lectures on applications is provided to clarify the strengths and limitations of these measurements in the field of electrochemical science and engineering, with particular emphasis on corrosion science and engineering.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.
 Specific topics addressed include structure of the electrified interface, Butler-Volmer equation for electrode dynamics, reference electrodes, hydrodynamic electrodes, linear sweep & cyclic voltammetry, potentiodynamic polarization and electrochemical impedance spectroscopy. No principle text will be assigned to the course. However, a list of relevant text books, all available in Thode library, will be provided.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>The Department of Materials Science and Engineering has a strong trust in electrochemical science and engineering, including the corrosion research led by Kish & McDermid, the electrochemical thin film synthesis and supercapacitor research led by Zhitomirsky, and the battery and fuel cell research led by Xu and Petric. Electrochemical techniques are the foundation on which critical information on the potential (driving force), current (rate) and mechanistic aspects is acquired. Therefore, it is absolutely necessary the graduate students have an appreciation for the techniques available as well as their inherent relative strengths and limitations.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>12</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>The course material will be presented in two parts. Part 1 will involve lectures given by the Instructor in which the fundamental theory is transferred to the students. Part 2 will involve student led seminars in which the applications of a specific technique is discussed, highlighting the relative strengths and weaknesses of that technique.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Students are required to give a seminar on the applications of a specific electrochemical technique. They will be graded on the content, style and understanding of the material present. Students are also required to submit a critical review of a journal article (selected by Instructor). Again, they will be graded on content, style and understanding. The seminar will be worth 60% of the final grade, whereas the critical review will be worth 40%.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>No</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>N/A</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Joey Kish Email: kishjr@ Extension: 21492 Date submitted: January 15, 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSE		
COURSE TITLE		Analytical Electron Microscopy		
COURSE NUMBER	MATLS 732	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (x)
INSTRUCTOR(S)		G. Botton		
PREREQUISITE(S)		MATLS 731 or 733 (or approval of instructor)		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input checked="" type="checkbox"/>	EXPLAIN: Changed the pre-requisite as this is an advanced course and students need the basics first. In the past, every student used to take 731 first but recently students have registered without this course and had to change course.		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>No change with respect to previous</p>
<p>2. EXPECTED ENROLMENT:</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: G. Botton Email: gbotton@mcmaster.ca Extension: 24767 Date submitted: 17 January 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSE		
COURSE TITLE		Introduction to electron microscopy		
COURSE NUMBER	MATLS 731	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE ()	QUARTER (MODULE) (x)
INSTRUCTOR(S)		G. Botton		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input checked="" type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. Electron sources, optics, development of scanning, transmission and scanning-transmission electron microscopes. Electron-solid interactions, production of secondary electrons, x-rays. Quantitative microanalysis in the scanning electron microscope.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used. The change with respect to the previous content reflects the fact that there is a more general introductory course (MATLS 733) and this course would focus more on the quantitative aspects of the microanalysis in the SEM.				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>No change with respect to previous</p>
<p>2. EXPECTED ENROLMENT:</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: G. Botton Email: gbotton@mcmaster.ca Extension: 24767 Date submitted: 17 January 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSE		
COURSE TITLE		SYNTHESIS AND APPLICATIONS OF NANOMATERIALS		
COURSE NUMBER	*6F03	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		G. BOTTON		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input checked="" type="checkbox"/>	PROVIDE THE NEW COURSE TITLE: SYNTHESIS, APPLICATIONS AND ENVIRONMENTAL IMPACT OF NANOMATERIALS		
CHANGE IN COURSE DESCRIPTION	<input checked="" type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar. Synthesis routes for nanomaterials, bottom-up and top-down approaches, green chemistry methods, properties of materials; carbon nontubes, nanoparticles, quantum dots. Environmental and health impact of nanomaterials.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: G. BOTTON Email: gbotton@ Extension: 24767 Date submitted: January 18/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSE		
COURSE TITLE		COMPUTATIONAL THERMODYNAMICS		
COURSE NUMBER	*6AA3	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		D. MALAKHOV		
PREREQUISITE(S)				
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION	<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE	<input type="checkbox"/>	CHANGE TO HALF COURSE	<input type="checkbox"/>	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: LACK OF ENROLMENT		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)
2. EXPECTED ENROLMENT:
3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):
4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (<u>percentage breakdown, if possible</u>): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)
5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).
6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?
PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:
Name: D. MALAKHOV Email: malakhov@ Extension: 24308 Date submitted: January 18/13

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Mechanical Engineering		
COURSE TITLE		Advanced Control on Internal Combustion Engines		
COURSE NUMBER	755	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Fengjun Yan		
PREREQUISITE(S)		Enrolment in any Engineering Graduate Program		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: January 2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO IF YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE
COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:		
OTHER CHANGES		EXPLAIN:		

BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

The course will introduce a variety of linear and nonlinear control design techniques that are particularly useful for internal combustion engine systems. Combinations of engine system characteristics with control theory will be described through examples generated from pertinent research projects. Matlab/Simulink will be extensively used for engine control system analysis, design, and simulation studies. There will be a student self-proposed or instructor-assigned term project.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

Content will cover the following topics:

- Overview of current automotive control systems (1)
- Overview of engine control systems (1)
- Control-oriented modeling for engines: air-path systems (2)
- Control-oriented modeling for engines: injection and combustion (2)
- Introduction to Lyapunov stability theory (2-3)
- Linear and nonlinear control design techniques in engine control (7-8)
- Introduction to hybrid and switched control systems (1-2)
- Introduction to parameter estimation and system identification (3-4)
- Lyapunov-based adaptive control (3)
- State estimation and parameter identification for engine systems (2)
- Engine control: conventional combustion (4)
- Engine control: advanced multi-mode combustion control (4-5)
- Engine after-treatment system control (2)

No textbook will be used. Lecture notes based on reference books and research papers will be available. Below are the reference books.

1. Goodwin, Graebe, Salgado, "Control System Design", Prentice Hall, 2001.
2. Glad and Ljung, "Control Theory - Multivariable and nonlinear methods", Taylor and Francis, 2000.
3. Franklin, Powell, Emami-Naeini, "Feedback control of dynamic systems", Addison- Wesley, 2002.
4. Desoer and Callier, "Linear Systems Theory", Springer-Verlag, 1991.
5. Anderson, Moore, "Optimal Control - Linear Quadratic Method", Prentice-Hall, Englewood Cliffs (1989)

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This course aims to introduce the advanced control system design for internal combustion engines. To meet the ever-growing demands on energy efficiency and emissions, engine control systems are evolving very fast with substantial growth in complexity. Internal combustion engine systems, as nonlinear multi-input-multi-output systems, often feature significant un-modeled dynamics and parametric uncertainties. Therefore, design of engine control systems require systematic combinations of understanding of engine system characteristics and advanced control theory. This course is for the students in Mechanical Engineering who are interested in and willing to do the research on vehicle powertrain system control, especially engine control.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>15</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Lectures</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Assignments (20%): There will be 4 assignments in this course, covering diesel engine modeling, control, estimation aspects. Each of the assignments count 5% of overall score.</p> <p>Mid-term report (40%): Critical literature reviews on current advanced control techniques.</p> <p>Term project and final report (40%): The term project is student self-proposed or instructor- assigned, related to the internal combustion engine estimation and control, and needs to be approved by the instructor. The innovation (10%), project quality (10%), completeness (10%), and report writing (10%) will be considered in the grading in this part.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>No</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>NO</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Dr. Fengjun Yan Email: yanfeng Extension: 21525 Date submitted: 2013-Jan-18</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

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SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		Walter G. Booth School of Engineering Practice		
COURSE TITLE		Special Topics in Engineering/Technology Entrepreneurship and Innovation		
COURSE NUMBER	SEP 719	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)		n/a		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: September 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE:** CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE	PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION	600-LEVEL COURSE (<i>Undergraduate course for graduate credit</i>) Please see #4 on page 2 of this form
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CHANGE TO FULL COURSE	CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE
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COURSE CANCELLATION	PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES	EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

Studies selected from specialized areas of research or representing special areas of expertise in areas of technology commercialization; entrepreneurship and innovation.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

This special topics course enables master's candidates to deepen their understanding of programs, policies, concepts used in starting up a business in the technology sector and the factors affecting successful university based technology commercialization

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>The specialized topics in the course will allow the student to deepen their understanding and skill in a specialized area of study related to entrepreneurship and innovation creating a technology based business.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>5</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Regular meetings Faculty and self-directed readings Literature reviews Expert consultations</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Assignments; Final Project and presentation to students and faculty</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>n/a</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>n/a</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: S. Chidiac Email: chidiac Extension: 26558 Date submitted: January 18, 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		WGB-SEP - all masters programs		
COURSE TITLE		Walter G. Booth School of Engineering Practice Seminar Series		
COURSE NUMBER	SEP771	COURSE CREDIT		
		FULL COURSE (x)	HALF COURSE ()	QUARTER (MODULE) ()
INSTRUCTOR(S)		Staff		
PREREQUISITE(S)		n/a		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: September 2013	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? <input checked="" type="checkbox"/> IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE:** CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form		
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE		CHANGE TO QUARTER COURSE

COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES		EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

This is a seminar series presented by guest speakers invited by the School of relevance to all Centres. All full time students are required to take this course in both fall and winter terms. Course grades are either 'pass' or 'fail'. In order to pass the course the student must attend a minimum of 80% of the seminars.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

This seminar series is intended to enhance the student's experiential learning by exposing the student body to innovative thinkers and practitioners in the areas of: Engineering Entrepreneurship and Innovation, Engineering Design, Engineering and Public Policy or Technology Entrepreneurship and Innovation. It should be considered a networking event to bring together our students, faculty and staff in a community atmosphere centred around learning initiative.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>Fulfills a key objective of the Walter G. Booth School of Engineering Practice: The school recognizes the need for life-long learning opportunities for engineers and scientists by providing a unique vehicle to enhance career horizons.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>100</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>seminars</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>sign in</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>no</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: S. Chidiac Email: chidiac Extension: 26558 Date: January 8, 2013</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Walter G. Booth School of Engineering Practice						
NAME OF PROGRAM		M.Eng in Manufacturing Engineering						
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. ()	M.B.A. ()	M. Eng. (X)	M.Sc. ()	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS		X	CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE			CHANGE IN COURSE REQUIREMENTS		X
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			EXPLAIN:					
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
<p>*Candidates must successfully complete a minimum of eight months of industrial work experience prior to applying to the program, of which a minimum of four months must be obtained at the graduate (i.e. post baccalaureate) level. Evidence of completing the first 4 mo. work term between the 3rd and 4th year is demonstrated by work term report which serves a milestone in ENG 4F00. Evidence of completing the second 4 mo. work term between 4th year and graduate studies is demonstrated by submitting a report that constituted a Pass/Fail in MANUF 700.</p> <p>*McMaster undergraduate students may apply for entry into the Accelerated Option. The accelerated option allows students to gain specific industrial experience in the manufacturing industry through a minimum four month work experience (facilitated through ECCS) and to complete two 600 level manufacturing-related courses in their final undergraduate year which will be counted towards their M. Eng. degree requirements. Completion of the requirements for the accelerated option are embodied in completion of the course ENG 4F00.</p> <p>A note of clarification: ENG 4F00 is a placeholder course to be used by the director of the manufacturing program to show evidence that a McMaster student has completed the application requirements to the manufacturing program while in their undergraduate degree program. A Pass is received if the candidate passes the two accelerated 600 level courses and gives a report for the first 4 month work term in a manufacturing environment.</p> <p>* MECH ENG 729 has been a keystone course in the program where the students learned about manufacturing management theory. This was a required course which all students in the program had to enrol.</p>								

PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (*Attach additional pages if space is not sufficient.*)

* DELETE requirement for 8 months of industrial experience prior to program entry

Previously 8 months of industrial experience was being required by the program, preferably through two coop terms. The coop had to involve manufacturing experience in order to be acceptable. At least one coop term is encouraged by students in the future program but it is difficult to maintain this expectation if we want to grow the size of the program. The fact that students must still identify an industrial sponsor for their thesis project requirement in the program will likely still see students going out for an industrial work term prior to program entry but by removing the requirement it allows the student some flexibility to find the project even after they have graduated from their undergraduate degree.

This removes the milestone requirement in ENG 4F00 and would delete MANUF 700. (to be discussed in a change course form).

* DELETE Accelerated Option. CHANGE calendar description so that McMaster undergraduate students may apply to have two manufacturing-related 600 level courses, Option Courses, be taken in their final undergraduate year for graduate credit.

The original requirement required students to plan in their 3rd year (or 4th year in a 5-year undergraduate program) to commit to the manufacturing graduate program and select two courses for their final year that may be counted towards their requirements in the graduate program. The Director would instruct the course lecturer to evaluate the student at 600 level requirements while taking these two 400 level courses and then follow up at the end of the term to determine if the student had achieved a B- minimum grade. These two courses, if passed, constituted a pass in the 'holder' course, ENG 4F00. The change avoids the undesirable situation where highly qualified candidates who decides in their final year that the graduate program would be useful to them, from being deterred because they now must take 6 half courses. The change simply requires students to petition the Associate Dean of Grad Studies for Engineering to accept two acceptable 600 courses with a manufacturing orientation completed in their final year of undergraduate studies. This change will mean that the Manufacturing program is electing to follow the M.Eng degree in Electrical and Biomedical Engineering in regards to how 600-level courses may be counted towards program requirements.

* DELETE MECH ENG 729 as a compulsory course.

This course can no longer be provided by Mechanical Engineering due to the departure of the faculty member involved. A change to allow an equivalence selection was made last year to give some flexibility till we were sure that it would no longer be given. The graduate calendar has a few similar courses (notably in the faculty of Business) but none are regularly offered. The director will now just recommend courses be taken in manufacturing theory when available by departments on a yearly basis.

RATIONALE FOR THE RECOMMENDED CHANGE:

To increase program enrollment by eliminating overly complicated approval requirements for application to the program that do not match similar programs. Entry requirements currently require a commitment by interested undergraduate students at least two years ahead of completing their undergraduate degree, planning coop work terms which provided a manufacturing role as well as stating up front at the start of their final year which courses will be used towards their program requirements. The changes allow a student to decide at the end of their final year of their undergraduate program at McMaster to enter the graduate program without penalty or refusal. Deleting the compulsory course requirement of MECH 729 is necessary since the course no longer is available nor can an equivalent course be found on a regular basis within McMaster.

PROVIDE IMPLEMENTATION DATE: *(Implementation date should be at the beginning of the academic year)*

September 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

Yes - deletion of courses Eng 4F00 and Manuf 700. These courses are no longer necessary if the changes are accepted.

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

See attached recommended calendar description with changes highlighted.

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Michael Thompson Email: mthomps@mcmaster.ca Extension: 23213 Date: November 5, 2012

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

MANUFACTURING ENGINEERING

The Master of Engineering in Manufacturing Engineering is a one and half- year program aimed at highly motivated students seeking advanced training in the broad area of Manufacturing. Application for admission to the program may be made through the Walter G. Booth School of Engineering Practice. The program accepts full-time and part-time students.

~~Successful applicants will be placed in the appropriate department of the Faculty of Engineering depending on the student's area of technical interest.~~ In addition to the general requirements for entry into a graduate program in Engineering, students must hold an Honours Bachelor's degree in Engineering with at least a B average (equivalent to a McMaster 8.0/12 GPA) in the penultimate and final years. ~~An accelerated option for the program is available to McMaster engineering undergraduates.~~

Delivery of the program includes a strong emphasis on project-based experience within the Manufacturing Industry, which is obtained through ~~a blend of industrial work experience and an~~ industry-based project during the coursework portion of the program. Requirements for these are outlined below. Due to the strong practical orientation of the ~~experiential and~~ project components of the program, successful completion requires that students have strong interpersonal and communication skills. To this end, each applicant will be interviewed. A strong performance in the interview is a critical requirement for admission.

~~The program accepts full time and part time students. The program is normally expected to take one year of study for students able to enroll full time and having completed the accelerated option during undergraduate enrollment at McMaster. This student would enroll in May and have minimal industrial experience. The program would normally comprise eight months of study for student enrolling in September with more extensive industrial experience.~~

Work Experience

~~Manufacturing based employment experience is a critical component of the program. All candidates must successfully complete a minimum of eight months of industrial work experience, of which a minimum of four months must be obtained at the graduate (i.e. post baccalaureate) level. Any applicants with a minimum of four months of appropriate undergraduate work experience will be required to apply for admission to the program in May with the objective of obtaining the required graduate level employment experience prior to the start of classes in September. Obtaining employment in an appropriate setting will be facilitated by McMaster's Engineering Co-op and Career Services (ECCS). Applicants should note that suitable employment is not guaranteed and that the onus is on the student to find suitable employment. The suitability of non-ECCS derived employment should be discussed with the program Director. Applicants with a minimum of one year of post baccalaureate manufacturing-related industrial experience will normally apply for admission into the program in September. The appropriateness of this employment experience will be judged by information provided to the program Director during the application process. Students must write a suitable report on~~

~~project work undertaken during the graduate work experience as part of the compulsory course MANUF 700.~~

Accelerated Option

~~This option is only available to students currently enrolled at McMaster as undergraduate engineering students in the Departments of Chemical Engineering, Materials Science and Engineering, and Mechanical Engineering. In exceptional circumstances, students from other Engineering departments may apply for entry into the accelerated option by contacting the program Director. Application for entry into the accelerated option occurs in the fall semester of the penultimate year of undergraduate studies. Applicants must have maintained a minimum CGPA of 8.0 for their undergraduate course work and successfully passed the interview with the program Director for admission into the accelerated option. The accelerated option allows students to gain specific industrial experience in the manufacturing industry through a minimum four month work experience (facilitated through ECCS) and to complete two 600-level manufacturing related courses in their final undergraduate year which will be counted towards their M. Eng. degree requirements. Completion of the requirements for the accelerated option are embodied in completion of the course ENG 4F00. Completion of this course along with meeting all of the other admissions criteria will result in a favourable recommendation by the program Director to the School of Graduate Studies for admission into the M. Eng. in Manufacturing Engineering program.~~

Project

Students must complete a suitable industry-based project. Projects will normally be performed individually or by groups of two to three students ~~and will~~which could ideally be multi-disciplinary in nature/composition. Projects should address a specific problem found in a manufacturing facility related to trouble-shooting, re-design or optimization. The problem should not be focused on the design of new processes or products as that lies beyond the prevue of this degree program. It is expected that the majority of the projects will be developed from work undertaken during ~~the graduate~~co-op or graduate employment experience and students should look for opportunities to develop projects with their employers. Students are also encouraged to develop their own ideas and find industrial sponsors. Identification of this project is the responsibility of the student and must be provided to the program director at the time of applying to the program. Project are ideally undertaken at local companies but may be conducted at locations before inside Canada or abroad with the Director's approval and provided that none of the work on the project was done prior to admissions into the program. Project groups or individuals will have an industry-based supervisor (stakeholder) with whom the student team can discuss progress, arrange trials etc. Students will also have an academic supervisor who will normally have some expertise in the subject area. It is expected that the teams will meet with their supervisors on a regular basis to discuss their progress.

Projects will have three "tollgate" stages. Student groups must submit a project proposal by the end of September to their academic and industrial supervisors for approval of scope, deliverables and timeline. The interim project report, outlining progress-to-date, is due at the

end of the fall semester for approval by the academic and industrial supervisors. The final written project report is normally due at the end of the winter semester. However, if the supervisors agree that the project group has not made sufficient progress by this point, they are free to request further work to meet the standards of the program. The project team will orally defend their final project report to an examination board comprised of their industrial supervisor, academic supervisor and program Director (Chair) or designate.

Courses

Students ~~must complete two compulsory full-year courses, one compulsory one-term (half) course and five option half courses or the equivalent combination of half-term (quarter) and half courses.~~ are required to successfully complete a compulsory full year course and six graduate half courses (or equivalent), of which at least four must be 700 level and up to two 600 level courses approved by the program director. Two of these 600 level courses can be taken in the final undergraduate year for graduate credit provided they are listed as option courses.

Half courses are marked with an asterisk (*) and quarter courses are marked with a pound sign (#). Students should note that not all option courses are offered every year.

Compulsory Courses:

~~MANUF 700 / Work Term Report~~

MANUF 701 / Project

~~MECH ENG *729 / Manufacturing Systems (or equivalent as determined by the program director)~~

~~MANUF 700 / Work Term Report~~

~~Work term report for graduate work term experience or equivalent, to be approved by their industrial supervisor(s). Report to be submitted by the end of September. Attendance at Manufacturing-related guest seminars and organised industry tours. Seminar to be given on M.Eng. project at the end of the academic year. All elements assessed on a Pass/Fail basis. Terms 1 and 2~~

~~Prerequisite: Enrolment in the M. Eng. Manufacturing Engineering program~~

MANUF 701 / Project

Industry-based multi-disciplinary project. Course elements are: project proposal (end of September), mid-year report (mid-December) and final report which will be examined orally. Evaluated on a Pass/Fail basis. Terms 1 and 2

Prerequisite: Enrolment in the M.Eng. Manufacturing Engineering program

Option Courses

Students ~~who did not complete the Accelerated Option~~ will select any combination from the list below totaling ~~two and a six~~ half courses, of which a maximum of two half courses can be taken at the 600 level. Two of these 600 level courses can be taken in the final undergraduate year for graduate credit~~Students who completed the Accelerated Option must select any combination~~

~~of courses totaling one and a half courses, all of which must be at the 700 level.~~ Other manufacturing-related courses may be substituted with permission of the Director. Note that not all courses are offered every year.

Chemical Engineering

- *6B03 / Polymer Reaction Engineering
- *6C03 / Statistics for Engineers
- *6E03 / Digital Computer Process Control
- *6X03 / Polymer Processing
- *6Z03/ Interfacial Engineering
- *742 / Membrane Based Bioseparations
- *752 / Optimization of Chemical Processes
- *753 / Process Modeling and Optimization
- *761 / Multivariable, Stochastic and Adaptive Control of Chemical Processes
- *764 / Process Control Design
- *765 / Multivariate Statistical Methods for Process Analysis and Monitoring
- *770 / Selected Topics in Polymer Science and Engineering
- *772 / Polymer Rheology
- *773 / Advanced Concepts of Polymer Extrusion
- *774 / Advances in Polymeric Materials
- *782 / Biopharmaceuticals
- *791 / Nanotechnology in Chemical Engineering

Materials Science and Engineering

- *6C03 / Modern Iron and Steelmaking
- *6D03 / Materials and the Environment
- *6H03 / Thin Film Science and Engineering
- *6I03 / Sustainable Manufacturing Processes
- *6P03 / Properties of Polymeric Materials
- *6R03 / Ceramic Science
- *6T03 / Properties and Processing of Composites
- ENG *6T04 / Materials Selection in Design and Manufacturing
- #740 / Interfacial Phenomenon in Materials Science
- ~~#743 / Advanced Topics in Corrosion Science and Engineering~~
~~Selected Topics in Oxidation and Corrosion~~
- #754 / Fracture Mechanics
- #755 / Deformation of Crystalline Solids
- *760 / Electronic Materials
- #765 / Selected Topics in Polymer Science and Engineering
- #771 / Principles of Heterogeneous Kinetics
- #773 / Properties of Metallurgical Slags
- #774 / Injection Metallurgy
- #775 / Physical and Mathematical Modeling of Materials Processing
- #780 / Metallic and Non-metallic Coatings

Mechanical Engineering

***6B03 / Topics in Product Development**

***6K03 / Robotics**

***6L03 / Industrial Design**

***6Q03 / Mechanical Vibrations**

***6T03 / Finite Element Applications**

***6Z03 / CAD/CAM/CAE**

***702 / Advanced Dynamics of Machines**

***705 / Advanced Finite Element Analysis**

***710 / Machine Tool Analysis**

***714 / Solidification Processing**

***724 / Solid and Surface Modeling Techniques**

***728 / Manufacturing Processes I**

***729 / Manufacturing Systems**

***734 / Theory of Plasticity**

***738 / Manufacturing Processes II**

***743 / Advanced Mechatronics**

***751 / Advanced Mechanical Engineering Control Systems**

***752 / Advanced MEMS Fabrication and Microfluidics**



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		M.Eng in Manufacturing Engineering		
COURSE TITLE		Work term report		
COURSE NUMBER	700	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (x)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Director, M.Eng in Manufacturing Engineering program		
PREREQUISITE(S)		Enrolment in the M. Eng Manufacturing Engineering program		
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)				
NEW COURSE	<input type="checkbox"/>	DATE TO BE OFFERED:	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? If YES, PROVIDE THE DATE:	
WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.				
CHANGE IN COURSE TITLE	<input type="checkbox"/>	PROVIDE THE NEW COURSE TITLE:		
CHANGE IN COURSE DESCRIPTION		<input type="checkbox"/>	600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form	
CHANGE TO FULL COURSE		<input type="checkbox"/>	CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE
COURSE CANCELLATION	<input checked="" type="checkbox"/>	PROVIDE THE REASON FOR COURSE CANCELLATION: Deleting the requirement of 8 months of industrial experience prior to program entry, no longer required.		
OTHER CHANGES	<input type="checkbox"/>	EXPLAIN:		
BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.				
CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.				

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>The course was a milestone requirement to indicate that student entering the program had received the necessary prior work experience. The program is recommending to remove this industrial work requirement and as a result, the course is no longer required.</p>
<p>2. EXPECTED ENROLMENT:</p> <p>4-6 / yr</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>Not applicable</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: Michael Thompson Email: mthomps@mcmaster.ca Extension: 23213 Date: Nov. 5, 2012</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2011



SCHOOL OF GRADUATE STUDIES

**RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM
- FOR CHANGE(S) INVOLVING DEGREE PROGRAM REQUIREMENTS /
PROCEDURES**

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** changes involving degree program requirements/procedures. **All** sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: *espiritu@mcmaster.ca*).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT		Faculties of Health Sciences, Engineering, and Business						
NAME OF PROGRAM		MSc eHealth						
PROGRAM DEGREE	Ph.D. ()	M.A. ()	M.A.Sc. ()	M.B.A. ()	M. Eng. ()	M.Sc. (X)	Diploma Program ()	Other (Specify)
NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)								
CHANGE IN ADMISSION REQUIREMENTS			CHANGE IN COMPREHENSIVE EXAMINATION PROCEDURE			CHANGE IN COURSE REQUIREMENTS		X
CHANGE IN THE DESCRIPTION OF A SECTION IN THE GRADUATE CALENDAR			X	EXPLAIN: EHealth 705 / Statistics for eHealth / is to be introduced as a new required course for all students in the program.				
OTHER CHANGES	EXPLAIN:							
DESCRIBE THE <u>EXISTING</u> REQUIREMENT/PROCEDURE:								
Currently, there is no required statistics course in the program..								
PROVIDE A DETAILED DESCRIPTION OF THE RECOMMENDED CHANGE (Attach additional pages if space is not sufficient.)								
The recommended change will affect the following section in the calendar for the MSc eHealth program: Degree Options and Internship A candidate for the M.Sc. eHealth degree may choose to take the program either full-time or part-time. The full-time program has two options: thesis or course-project. In the thesis option, students must complete the required courses plus one elective course from the field of specialization (a total of five courses). In addition, students must complete and defend a Master's thesis successfully. The thesis option is not open to part-time students. Completion of the M.Sc. thesis option is the preferred route to a Ph.D. program in a similar field (e.g., Health Research Methodology, Computer Science, or Business). In the course-project option (which may be taken full or part-time), students take the required courses, two electives from the field of specialization, and two other electives selected from one or both of the other two fields (for a total of eight courses). All courses must be completed with at least a B- standing. In line 4, "four" has been replaced with "five". In the last line, "seven" has been replaced with "eight". Additionally, a description of the new required course eHealth 705 will be included in the program's calendar copy as follows: *705 / Statistics for eHealth / Staff This course covers basic statistical concepts and techniques as they apply to the analysis and presentation of data in eHealth practice. The statistical software package SPSS will be used extensively. The course includes graphical presentation of data, elementary probability, descriptive statistics, and probability distributions. Statistical inferencing techniques, including statistical decision theory, confidence intervals, hypothesis tests (z-tests, t-tests, and non-parametric methods), ANOVA, contingency tables, ch-square tests, correlation, and simple and multiple regression. Students will analyze data gathered from eHealth studies and will review examples drawn from published eHealth research. Prerequisite: Enrolment in the MSc eHealth program or permission of the instructor.								

RATIONALE FOR THE RECOMMENDED CHANGE:

Students in the eHealth program (particularly thesis students) are often required to analyze statistical data. Although students admitted to the program may claim they have taken a university-level statistics course, they are often incapable of performing statistical analysis beyond very basic functions. The purpose of the new required course is to ensure that all our students are capable of gathering and analyzing statistical data satisfactorily, both while in the program and in their careers in the eHealth field.

PROVIDE IMPLEMENTATION DATE: (Implementation date should be at the beginning of the academic year)

September 2013

ARE THERE ANY OTHER DETAILS OF THE RECOMMENDED CHANGE THAT THE CURRICULUM AND POLICY COMMITTEE SHOULD BE AWARE OF? IF YES, EXPLAIN.

This recommendation is accompanied by a proposed change involving the introduction of the new course eHealth 705

PROVIDE A DESCRIPTION OF THE RECOMMENDED CHANGE TO BE INCLUDED IN THE CALENDAR:

Degree Options and Internship

A candidate for the M.Sc. eHealth degree may choose to take the program either full-time or part-time. The full-time program has two options: thesis or course-project. In the thesis option, students must complete the required courses plus one elective course from the field of specialization (a total of five courses). In addition, students must complete and defend a Master's thesis successfully. The thesis option is not open to part-time students. Completion of the M.Sc. thesis option is the preferred route to a Ph.D. program in a similar field (e.g., Health Research Methodology, Computer Science, or Business). In the course-project option (which may be taken full or part-time), students take the required courses, two electives from the field of specialization, and two other electives selected from one or both of the other two fields (for a total of eight courses). All courses must be completed with at least a B- standing.

The course description will also be included, as follows:

*705 / Statistics for eHealth / Staff

This course covers basic statistical concepts and techniques as they apply to the analysis and presentation of data in eHealth practice. The statistical software package SPSS will be used extensively. The course includes graphical presentation of data, elementary probability, descriptive statistics, and probability distributions. Statistical inferencing techniques, including statistical decision theory, confidence intervals, hypothesis tests (z-tests, t-tests, and non-parametric methods), ANOVA, contingency tables, ch-square tests, correlation, and simple and multiple regression. Students will analyze data gathered from eHealth studies and will review examples drawn from published eHealth research.

Prerequisite: Enrolment in the MSc eHealth program or permission of the instructor.

CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:

Name: Norm Archer Email: archer@mcmaster.ca Extension: 23944 Date: January 9, 2013

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.



SCHOOL OF GRADUATE STUDIES

RECOMMENDATION FOR CHANGE IN GRADUATE CURRICULUM - FOR CHANGE(S) INVOLVING COURSES

PLEASE READ THE FOLLOWING NOTES BEFORE COMPLETING THIS FORM:

1. This form must be completed for **ALL** course changes. All sections of this form **must** be completed.
2. An electronic version of this form must be emailed to the Assistant Secretary and SynApps System Administrator (Email: espiritu@mcmaster.ca).
3. A representative from the department is required to attend the Faculty Curriculum and Policy Committee meeting during which this recommendation for change in graduate curriculum will be discussed.

DEPARTMENT/PROGRAM		MSc eHealth		
COURSE TITLE		Statistics for eHealth		
COURSE NUMBER	705	COURSE CREDIT		
		FULL COURSE ()	HALF COURSE (X)	QUARTER (MODULE) ()
INSTRUCTOR(S)		Norm Archer, Ann McKibbon		
PREREQUISITE(S)		Enrolment in MSc eHealth program, or permission of instructor		

NATURE OF RECOMMENDATION (PLEASE CHECK APPROPRIATE BOX)

NEW COURSE	<input checked="" type="checkbox"/>	DATE TO BE OFFERED: Winter 2014	WAS THE PROPOSED COURSE OFFERED ON DEAN'S APPROVAL? NO IF YES, PROVIDE THE DATE:
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WILL THE COURSE BE CROSS-LISTED WITH ANOTHER DEPARTMENT? NO IF YES, ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S). **NOTE: CROSS-LISTING OF COURSES REQUIRES WRITTEN APPROVAL FROM EACH DEPARTMENT AND FACULTY CONCERNED.**

CHANGE IN COURSE TITLE		PROVIDE THE NEW COURSE TITLE:
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CHANGE IN COURSE DESCRIPTION		600-LEVEL COURSE (Undergraduate course for graduate credit) Please see #4 on page 2 of this form	
CHANGE TO FULL COURSE		CHANGE TO HALF COURSE	CHANGE TO QUARTER COURSE

COURSE CANCELLATION		PROVIDE THE REASON FOR COURSE CANCELLATION:
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OTHER CHANGES		EXPLAIN:
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BRIEF DESCRIPTION FOR CALENDAR - Provide a brief description (maximum 6 lines) to be included in the Graduate Calendar.

This course covers basic statistical concepts and techniques as they apply to the analysis and presentation of data in eHealth practice. The statistical software package SPSS will be used extensively. The course includes graphical presentation of data, elementary probability, descriptive statistics, and probability distributions; statistical inferencing techniques, including statistical decision theory, confidence intervals, hypothesis tests (z-tests, t-tests, and non-parametric methods), ANOVA, contingency tables, ch-square tests, correlation, and simple and multiple regression. Students will analyze data gathered from eHealth studies and will review examples drawn from published eHealth research. Prerequisite: Enrolment in the MSc eHealth program or permission of the instructor.

CONTENT/RATIONALE - Provide a brief description, i.e., outline the topics or major sub-topics, and indicate the principal texts to be used.

We expect to use the text "Statistics for the Health Sciences", by Christine Dancey, John Reidy, and Richard Rowe (Sage, 2012). The course will include the following topics, interspersed by readings from the published literature on statistical studies in eHealth: Overview of the research process; descriptive statistics; graphical displays; introduction to SPSS. Statistical tests; sampling; probability distributions; statistical significance; confidence intervals. Hypothesis tests; t test; non-parametric tests (Kolmogorov-Smirnov one sample test). Two-sample tests (t tests, Mann-Whitney). Data screening and cleaning. One way analysis of variance. Categorical variables; Chi-square test; contingency measures; Correlation (Pearson's r and Spearman's rho). Linear regression; outliers. Multiple regression; dummy variables.

<p>1. STATEMENT OF PURPOSE (How does the course fit into the department's program?)</p> <p>This is a new required course to prepare MSc eHealth students for analyzing and understanding the variety of data they must deal with in the eHealth environment</p>
<p>2. EXPECTED ENROLMENT:</p> <p>25-30. Our current annual student intake is in this range, and all our full-time students will take this required course in their first year of their programs, and the part-time students will take it early in their programs.</p>
<p>3. DESCRIBE IN DETAIL THE METHOD OF PRESENTATION OF COURSE MATERIAL (i.e., lectures, seminars):</p> <p>Students will prepare for each lecture by reading assigned material, reviewing required readings, and doing assigned statistical analysis. Classes will normally include two hours of tutorial, where students will work individually or as teams to address applications that demonstrate the material presented the previous week. This will be followed by an hour of lecture or guest presentation on the topic for the following week. The instructor and tutorial assistants will work with students as needed during the tutorials.</p>
<p>4. DESCRIBE IN DETAIL THE METHOD OF EVALUATION (percentage breakdown, if possible): (For 600-level course, indicate the <u>Extra Work</u> to be required of graduate students, i.e., exams, essays, etc.)</p> <p>Students will be graded on the following basis: 1) Individual performance observed in tutorials and class (10%); 2) Two hand-in assignments, each worth 10% (Total 20%); 3) Multiple choice and short answer mid-term (30%); 4) Teams of no more than 4 students will choose topics from a list and give presentations (20%) and submit written reports (20%) near the end of term. These topics will involve a critical review, explanation, and analysis of one or more published papers about some aspect of eHealth involving statistics.</p>
<p>5. TO PREVENT OVERLAP, IS A COURSE IN THE SAME OR A RELATED AREA OFFERED IN ANOTHER DEPARTMENT? IF YES, PLEASE ATTACH TO THIS FORM ANY RELEVANT CORRESPONDENCE WITH THE OTHER DEPARTMENT(S).</p> <p>HRM 702, NUR 709, and BUS Q600 have some overlap with the proposed course, but none are oriented towards eHealth applications. Also, the first two are not offered in the Winter term, which is where the course is needed for the eHealth program.</p>
<p>6. IF THE COURSE IS INTENDED PRIMARILY FOR STUDENTS OUTSIDE YOUR DEPARTMENT, DO YOU HAVE THE SUPPORT OF THE DEPARTMENT/PROGRAM CONCERNED?</p> <p>This course is intended only for students in the MSc eHealth program</p>
<p>PLEASE PROVIDE THE CONTACT INFORMATION FOR THE RECOMMENDED CHANGE:</p> <p>Name: N. Archer Email: archer@mcmaster.ca Extension: 23944 Date submitted: December 06, 2012</p>

If you have any questions regarding this form, please contact Medy Espiritu, Assistant Secretary and SynApps System Administrator, School of Graduate Studies, extension 24204.

SGS/Medy/2012